REMARKS

After the foregoing amendment, claims 4-11, as amended, are pending in the application. Claims 1-3 have been canceled. Claim 4 has been amended. Claims 10 and 11 are allowed. Applicant submits that no new matter has been added to the application by the Amendment.

Rejection - 35 U.S.C. §101

The Examiner rejected claims 4 and 9 under the judicially created doctrine of double patenting over claim 1 of U.S. Patent Nos. 7,106,728, 7,079,532, 6,999,466 and 7,065,073.

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A registered attorney or agent of record may sign a terminal disclaimer.

Applicant has attached a Terminal Disclaimer disclaiming any extension of the right to exclude duplicating features of the present invention over U.S. Patent Nos. 7,106,728, 7,079,532, 6,999,466 and 7,065,073. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §101 rejection of claims 4 and 9.

Definitions

When the specification provides definitions for terms appearing in the claims, the specification can be used in interpreting the claim language. (MPEP 2111.01-I). An Applicant is entitled to be his own lexicographer. (MPEP 2111.01-III). Any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation. (MPEP 2111.02-I).

The following are definitions drawn from the specification:

1. Definition G3: "sorting cell". Consider an in-band-controlled switching

cell where all possible values in an in-band control signal form a partially ordered set. This switching cell is called a "sorting cell associated with this partially ordered set" if it is under the switching control such that the input signal switched to output-0 is never greater than the one switched to output-1. (See page 159.)

2. Definition G4: "0-1 sorting cell" and "routing cell". The set {0, 1} under the natural order of 0<1 forms the "0-1 ordered set", and the associated sorting cell is called the "0-1 sorting cell". A "routing cell" is a sorting cell associated with the set {`0-bound`, `idle`, `1-bound`} under the linear order `0-bound`<`idle`<`1-bound`. (See pages 159-160.)

3. Definition A6: "expander cell". An "expander cell" is a multicast switch with the four connection states (211, 212, 213, 214) as in shown in FIGS. 2C-2F, respectively, which includes the bar state (211) and cross state (212) of the switching cell. In particular, the connection states are: ({0},{1}); ({1},{0}); ({0,1}, null); and (null, {0,1}). (See page 28 and pages 168-169).

Connection state of the expander cell		Signal at input-1			
		"idle"	"0-bound"	"1-bound"	"bicast"
Signal at input-0	"idle"	Any	Cross	Bar	Bicast-1
	"0-bound"	Bar	Contention for output-0	Bar	Bar
	"1-bound"	Cross	Cross	Contention for output-1	Cross
	"bicast"	Bicast-0	Cross	Bar	Bar/Cross

Table 7

4. A bicast signal (i.e. bicast packet) are those data signals intended for multicasting to both output-0 and output-1 of a cell. (See page 168).

5. Definition G6: "bicast cell". A "bicast cell" is an expander cell under the following in-band-control. If one of the two inputs presents a bicast packet and the other presents an idle packet, the bicast packet is "bicasted", which means:

(1) a copy of the bicast packet is sent to each of the two outputs through the bicast-0 or bicast-1 connection state;

(2) the copy received by output-0 assumes the status of a 0-bound packet

instead of a bicast packet, i.e., the control signal of the copy received by output-0 is set to be `0-bound`; and

(3) the copy received by output-1 assumes the status of a 1-bound packet instead of a bicast packet, i.e., the control signal of the copy received by output-1 is set to be `1-bound`. (See page 169.)

6. Definition H3: "m-to-n concentrator". For n<m, an m-to-n concentrator is an mxm switch having a "0-output group" comprising the m-n outputs with the smallest addresses, that is, from 0 to m-n-1, and a "1-output group" comprising the remaining n outputs such that when the given input signals to the concentrator are subject to a partial order, then any signal routed to the 0-output group is never greater than any signal routed to the 1-output group under the said order. Thus, an m-to-n concentrator can be regarded as a device which is capable of partitioning the m input signals (including real data input signals and artificial idle expressions) into two groups: the group of n largest signals, which are routed to the 1-output group, and the group of m-n smallest signals, which are routed to the 0-output group. As per the graph representation, by default the m-to-n concentrator is the one wherein the upper m-n output ports form the 0-output group and the lower n output ports form the 1-output group (See page 192, line 11 to page 193, line 5).

7. Definition H4: "m-to-n multicast concentrator". For n<m, an mxm switch having a "0-output group" comprising the m-n outputs with the smallest addresses, that is, from 0 to m-n-1, and a "1-output group" comprising the remaining n outputs and receiving 0-bound, 1-bound, idle and bicast input signals is called an m-to-n "multicast concentrator" if it routes the maximum total number of 0-bound and bicast signals to the 0-output group and the maximum total number of 1-bound and bicast signals to the 1-output group. (See page 200, line17 to page 201, line 4). An m-to-n concentrator constructed from a partial sorting network of interconnected routing cells can be adapted into an m-to-n multicast concentrator by replacing each of the routing cells with a bicast cell as defined in Definition G6. (See pages 201, line 16 to page 202, line 3.)

Rejection - 35 U.S.C. §103

The Examiner rejected claims 4 and 9 under 35 U.S.C. §103 over U.S. Patent No.

5,506,840 (Pauwels et al.) in view of U.S. Patent No. 6,882,652 (Scholtens et al). The Examiner first states at page 5, 1st paragraph that Fig. 2 of Pauwels et al. illustrates multicast switching. The Examiner further states that Pauwels et al., at cols. 7 to 9, teaches a concentrator. The Examiner also states that Pauwels et al. does not expressly disclose bicast signals but it would be obvious to the artisan as a matter of the packet routing, and the use of *bicast setting* in routing signals processing is well known in the art of in the multiplex communication system and further that Scholtens et al. teaches a techniques for re-arranging channel[s] among packet communications. Applicant respectfully traverses the rejection.

Pauwels et al. is directed to an asynchronous switching node. The node comprises N incoming terminal modules made up of N translator circuits T1 to TN and a switching network SN having N input ports and N' output ports (col. 7, lines 36-46). The output ports are grouped into k output groups. Each terminal module translates external routing data, for example a VCI-VPI connection identifier into internal routing labels which are identical for all cells of that connection. The label defines a distribution tree, i.e. a set of branches where each branch comprises all the routes that a cell may use from the receiving input port to one of the output ports of the group to which the cell is addressed (col. 7, lines 53-63).

Applicant first wishes to point out that Fig. 2 of Pauwels does not illustrate multicast switching as stated by the Examiner. As clearly stated at col. 2, lines 19-21, "Fig. 2 ...is a diagram showing the switching elements of a network "SN1" for effecting only point-to-point routing." As would be well understood by those skilled in the art, point-to-point routing results in the routing of a single input to a single output, and a request for multicast routing switching can never be accommodated by a point-to-point switch.

Applicant further wishes to point out that the network described by Pauwels et al. is not a concentrator. In order to be a concentrator, as defined by the Applicant, the routing tag of any signal routed to the 0-output group can never greater than any signal routed to the 1-output group under the said order. This is clearly not the case with the switch described by Pauwels et al.

Pauwels et al. is a switching network in which an input signal at an input port may be routed to a selected group of output ports by adding a link group address (LGA) to the input packet prior to its header. (See col. 18, lines 10-18.) In contrast, the destination output group of each packet input to Applicant's concentrator is determined by an ordering of the routing signals

of each of the input packets with each other within the switch. Consequently, even though the switch described by Pauwels et al. can be configured to route an input signal to one of two groups, the switch described by Pauwels et al. is not a concentrator as defined by Applicant.

Applicant, further submits that the multicast switch described at cols. 15-16 and Fig. 8 is not a multicast concentrator, as defined by Applicant, for the same reasons as described above.

More specifically, the switch described by Pauwels et al. does not disclose, teach or suggest a capability for routing input signals from the set of 0-bound, 1-bound, bicast and idle signals. Pauwels et al. discloses input signals whose routing is determined by a VCI-VPI identifier (col. 7, lines 53-58). Similarly, while Scholtens et al. discloses a switch which can bicast TDM traffic, that traffic is routed based on a change in provisioning (i.e. out-of-band control) and not based on the input signal, as claimed. Further, the Examiner has not made a showing that the class of signals that use a VCI-VPI identifier are equivalent to signals that are 0-bound, 1-bound, bicast and idle. Also, the Examiner's assertion that a bicast signal is well known is unsupported by any evidence put forth by the Examiner. Accordingly, Applicant traverses the assertion and respectfully requests that the Examiner support the assertion with a relevant reference that shows the use of bicast signals, as defined by the Applicant, as input signals to a multicast concentrator as defined by Applicant.

One construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material or acts described therein, and equivalents thereof. Paragraph six of 35 U.S.C. § 112 applies regardless of the context in which the means-plus-function language arises, i.e. whether as part of a patentability determination in the PTO or as part of a validity or infringement determination in a court. *In re Donaldson, Inc.*, 29 USPQ2d 1845 (Fed. Cir. 1994); MPEP 2181.

Claim 4 has been amended to recite, *inter alia,*

> *means, including at least one bicast cell, responsive to the input signals, for routing the maximum possible total number of 0-bound and bicast ones of the input signals to the 0-output group and the maximum possible total number of 1-bound and bicast ones of the input signals to the 1-output group.*

The corresponding structure to the means for routing the maximum possible total number of 0-bound and bicast ones of the input signals to the 0-output group and the maximum possible total number of 1-bound and bicast ones of the input signals to the 1-output group and the support for the amendment to claim 4 is shown at pages 168-169 and 200-205 of the application. As clearly shown and described, the claimed means includes a "bicast cell".

As defined in the application on pages 168-169 and repeated above, a bicast cell is characterized by a logic which determines the switching state of a 2X2 switch for any combination of 0-bound, 1-bound, idle and bicast signals which are simultaneously applied to the input of the bicast cell.

Neither Pauwels et al. nor Scholtens et al. teach or suggest a multicast concentrator that includes a bicast cell. The switching elements disclosed by Pauwels et al. are not bicast cells because the switching elements disclosed by Pauwels et al. do not identify a switching state for every combination of 0-bound, 1-bound, idle and bicast signals which are simultaneously applied to the two inputs of the switch. Neither does Scholtens et al. disclose that the switch modules shown in Fig. 3 include a switching state for every combination of 0-bound, 1-bound, idle and bicast signals applied to the two inputs of the switch.

Applicant submits that the combination of Pauwels et al. and Scholtens et al. does not make claim 4 obvious. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §103 rejection of claim 4.

Applicant submits that claim 9 is allowable for the same reasons that claim 4 is allowable. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §103 rejection of claim 9.

Allowable Subject Matter

The Examiner objected to claims 5-8 as being dependent upon a rejected base claim but stated that claims 5-8 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Claim 4 has been shown to be allowable. Consequently, claims 5-8 dependent on claim 4 are allowable, at least by their dependency on allowable claim 4. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the objection to claims 5-8.

Conflicting Claims

The Examiner has stated that claims 4 and 11 conflict with the claims of application Nos. 09/882,439, 09/882,075, and 09/882,112, citing MPEP § 822. The Examiner is requiring that Applicant cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. Applicant traverses the requirement as stated.

MPEP section § 822 and 37 C.F.R. 1.78(b) apply to the treatment of plural applications of the same entity, none of which have become a patent. Application No. 09/882,439 is now patent No. 6,999,466; application No. 09/882,075 is now patent No. 7,042,878 and application No. 09/882,112 is now patent No. 7,079,532. Consequently, MPEP § 822 is inapplicable. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the stated requirement.

Conclusion

Insofar as the Examiner's objections and rejections have been fully addressed, the instant application, including claims 4-11, is in condition for allowance and Notice of Allowability of claims 4-11 is therefore earnestly solicited.

Respectfully submitted,

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